REMARKS

Claims 1-57 are pending in the application.

Claims 1-57 stand rejected.

Claims 1, 4, 17, 30, 33 and 55 have been amended.

Rejection of Claims under 35 U.S.C. §101

Claims 1-54 stood rejected under 35 U.S.C. §101 as being directed to non-statutory matter in the final Office Action. Claims 1 and 30 were amended to address the Examiner's concerns, and, given that the rejection was not been noted in the Advisory Action (dated March 30, 2005), is therefore respectfully believed to have been overcome thereby. Applicants invite the Examiner to correct their understanding, if such is not the case.

Rejection of Claims under 35 U.S.C. §103

Claims 1-15, 30-44 and 55-57 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jones et al., U.S. Patent No. 5,812,844 (Jones). Applicants respectfully traverse this rejection.

Applicants submit that the claimed invention is not obvious in light of Jones because a prima facie case of obviousness has not been established. Jones fails to provide at least two of the elements required to establish prima facie obviousness: "[T]he prior art reference ... must teach or suggest all the claim limitations" and "there must be some suggestion or motivation...to modify the reference." (MPEP 706.02[j]).

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First, Applicants submit that Jones does not teach or suggest all the limitations of the independent claims (e.g., claim 1). For example, Jones does not show, teach or suggest "an element-specific selection adjustment." In paragraph 8(d), the Final Office Action states that various teachings of Jones suggest "an element specific selection." Applicants note that the Final Office Action left out the term "adjustment" in the aforementioned rejection. The MPEP states that "all words in a claim must be considered in judging the patentability of that claim against the prior art." (§2103.43). Therefore, Applicants regard the exclusion of the term "adjustment" as a typographical error and respond to the Office action's rejection of claim 1 as though it stated "element-specific selection adjustment."

The Final Office Action stated that the following steps of Jones suggest an "element-specific selection adjustment":

"a scheduler recalculates the restart time for the thread on the processor list,"

In the Advisory Action, this point is further explained by drawing a parallel between the claimed element-specific selection adjustment, and the thread on the processor list and the recalculation of the restart time, in the following manner:

element-specific selection - the thread on the processor list

adjustment - recalculation of the restart time

This parallel is inapposite for at least two reasons. First, the claim term has been deconstructed in a manner that is not in harmony with its intended meaning. The claim term is "element-specific selection adjustment" – breaking out the term "adjustment" and equating that term with an element taught by the reference, even if that element is comparable to the claim term (which Applicants maintain is not the case) is not proper. As noted, "all words in a claim must be considered in judging the patentability of that claim against the prior art." (§2103.43)

Moreover, as noted, the recalculation of the restart time does not show, teach or suggest an element-specific selection adjustment.

Secondly, even if the term "element-specific selection adjustment" is divided as posited in the Advisory Action, Jones fails to show, teach or suggest even the constituents of this claim limitation. With regard to "adjustment," Jones describes two techniques for recalculating the restart times. (column 11, lines 50-67). According to the first technique, Jones increments the restart time by the execution time of the thread (time executed). In the second technique, Jones increments the restart time by "time executed/CPU reservation," which can be represented by the equation:

$$\text{restart\_time} \leftarrow \text{restart\_time} + \frac{\text{time\_executed}}{\text{CPU\_reservation}}$$

A similar equation, according to one embodiment of claim 1, can be implemented to update an element's "measure-of-use." In this particular embodiment, the "period-of-use" is a thread's quantum of execution and the "measure-of-use adjustment" is the weight of the thread. (specification, pages 12, lines 12-15). Claim 1 recites that the "measure-of-use" is updated responsive to a "period-of-use" and a "measure-of-use adjustment." The specification, on page 21, illustrates the aforementioned embodiment of claim 1 by showing how actual virtual time (measure-of-use) is updated according to an equation that includes a quantum of execution (period-of-use) and a weight of the thread (measure-of-use adjustment):

$$\text{actual\_virtual\_time} \leftarrow \text{actual\_virtual\_time} + \frac{\text{quantum\_of\_execution}}{\text{weight\_of\_thread}}$$

Applicants note that scheduling a resource, as recited in claim 1, is responsive to more than just the actual virtual time (measure-of-use). The claimed invention assigns an element to a

resource responsive to the element's "measure-of-use" *and* "element-specific selection adjustment," while Jones uses only the re-start time in selecting a thread. Thus, Jones re-start time cannot serve to show, teach or suggest *both* these claim elements.

Moreover, even if Jones did suggest even the *availability* of an "element-specific selection adjustment," which Applicants maintain Jones fails to do, Jones fails to provide any motivation to modify the reference to provide an "element-specific selection adjustment." The Office action states "it would have been obvious to one of ordinary skill in the art to have applied the teachings of Jones for the assigning step in order to provide a means for *efficiently allocating the processor to a thread for the appropriate amount of time without having to interrupt the schedule*." (emphasis added). The Office action is correct in suggesting that Jones is motivated to find a way to "efficiently allocat[e] the processor to a thread for the appropriate amount of time without having to interrupt the schedule." Indeed, on column 3, lines 25-35, Jones states, "This aspect of the invention [timer interrupts] minimizes the processor time spent scheduling the processor, or 'scheduling latency,' as the facility may efficiently allocate the processor to a thread for the appropriate amount of time without having to interrupt the thread to reevaluate the schedule." (column 3, lines 25-35). However, as the foregoing citation demonstrates, Jones already solves the problem of "allocating the processor to a thread for the appropriate amount of time without having to interrupt the schedule" by implementing timer interrupts.

Nothing in Jones suggests the need to look for a different or better solution to "efficiently allocate the processor to a thread…without having to interrupt the thread." In fact, one of ordinary skill in the art would not find any motivation to use an "element-specific selection adjustment" to improve or replace the timer interrupt functionality of Jones because it is unclear how an "element-specific selection adjustment" could improve or replace a timer interrupt.

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Further, by reciting the limitation of assigning an element to a resource responsive to "an element-specific selection adjustment" and a "measure-of-use" (which is responsive to a "period-of-use" and a "measure-of-use adjustment"), the claimed invention adds at least one variable to the equation disclosed by Jones. On the other hand, Jones teaches that a thread is selected based on "time executed" and a "CPU reservation," and then discloses that a thread can alternatively be selected based only on "time executed." Thus, instead of suggesting the use of an additional variable, such as an "element-specific selection adjustment," Jones suggests dropping a variable from the equation. In conclusion, instead of suggesting the use an "element-specific selection adjustment," Jones actually teaches away from using an "element-specific selection adjustment."

To more clearly demonstrate the aforementioned differences, Applicants have amended claims 1, 30 and 55 to recite that the element-specific selection adjustment for each element in the plurality of elements is borrowed virtual time. Not only is such a concept not disclosed in Jones, no such concept is even suggested by Jones. This is because, as noted above, Jones is satisfied with the solutions provided therein, to the situations contemplated thereby.

Applicants respectfully submit that Jones therefore fails to teach or suggest all of the claim limitations of claim 1. Furthermore, Applicants submit that there is no suggestion or motivation to modify Jones to provide the limitations of claim 1. Applicants therefore respectfully submit that claim 1 clearly distinguishes over Jones, taken alone or in permissible combination with the relevant skill in the art. Applicants submit that these arguments apply with equal force to independent claims 1, 30 and 55. Therefore, Applicants respectfully submit that independent claims 1, 30 and 55, as well as claims 2-29, 30-54 and 56-57, which depend on claims 1, 30 and 55, are allowable for at least the foregoing reasons. Applicants respectfully request withdrawal of the rejections based upon 35 U.S.C. §103(a). Accordingly, Applicants respectfully submit that claims 1-57 are in condition for allowance.

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Rejection of Claims under 35 U.S.C. §103: Jones in view of Chow

Claims 16-29 and 45-54 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jones et al., U.S. Patent No. 5,812,844 (Jones) in view of Chow et al., U.S. Patent No. 6,438,134 (Chow). Applicants respectfully traverse this rejection.

With respect to the references cited, Applicants respectfully maintain that Jones, in view of Chow, fails to show, teach or suggest the limitations of claim 16. As mentioned in the Office Action, Jones does not teach that "the plurality of elements is a plurality of queues and said resource is bandwidth of an output port of a data switch." Furthermore, as previously discussed, Jones does not teach "assigning one of said plurality of elements to use said resource for a second period of use responsive to said measure-of-use and an element-specific selection adjustment for each element in said plurality of elements, wherein said element-specific selection adjustment for said each element in said plurality of elements is borrowed virtual time."

Chow does not remedy either of these deficiencies of Jones to provide the limitations of claim 16. First, in column 3, lines 16-47 Chow discloses a resource that is idle bandwidth allocated to a queue. However, Chow does not teach that the resource is the bandwidth of an *output port of a data switch*, as claimed in claim 16. Second, in column 3, lines 16-47 Chow does not show, teach or suggest assigning one of said plurality of elements to use said resource for a second period of use responsive to even a measure of use. In conclusion, both Jones and Chow fail to show, teach or suggest the following two limitations of claim 16: (1) the plurality of elements is a plurality of queues and said resource is bandwidth of an output port of a data switch and (2) assigning one of said plurality of elements to use said resource for a second period

of use responsive to said measure-of-use and an element-specific selection adjustment for each element in said plurality of elements.

Furthermore, neither Jones nor Chow provides any motivation to combine their disclosures to provide any advantages over either reference taken separately. This is likely due, at least in part, to how Jones and Chow address different problems in different systems. Chow solves the problem of sub-optimal idle bandwidth distribution by decoupling the instantaneous idle bandwidth of a queue from the allocated service rate of the queue. (column 3, lines 17-34). Jones solves problems related to device interrupt handling by using time specific scheduling constraints to limit the amount of time a thread can execute. (column 2, lines 25-40).

Jones provides no motivation to look to Chow to provide better time specific scheduling constraints because Chow focuses on a handling idle bandwidth, and the principles taught by Chow would not provide any advantages to a system for providing time specific scheduling constraints. Chow provides no motivation to look to Jones to provide improved handling of idle bandwidth because putting time specific scheduling constraints on bandwidth allocation would not provide any further advantages to Chow's system. In conclusion, neither Jones nor Chow provides any motivation to combine their references to provide additional advantages over either reference taken separately; therefore, neither reference provides any motivation to combine their references to provide the advantages of the present invention, such as using an element specific selection adjustment to fairly allocate an element to a resource.
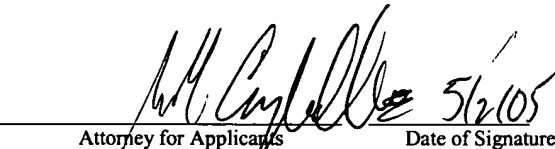
Applicants respectfully submit that claim 16 clearly distinguishes over Jones, taken alone or in permissible combination with Chow. Applicants submit that these arguments apply with equal force to claim 45. Applicants therefore respectfully submit that claims 16 and 45, as well

as claims 17-29 and 46-54, which depend on claims 16 and 45, are allowable for at least the
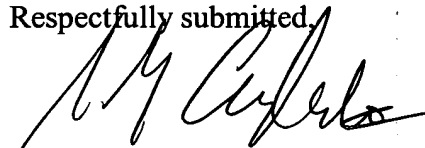
foregoing reasons.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be

in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues

remain that might be subject to resolution through a telephonic interview, the Examiner is invited

to telephone the undersigned at 512-439-5084.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on May 2, 2005.

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